

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 5947

CSAH NO. 33

OVER THE

MISSISSIPPI RIVER

DISTRICT 3 - BENTON COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 15A)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 5947, Piers 2 and 3, were found to be in good to satisfactory condition below water. Pier 3 exhibited undermining at the southeast corner due to an area of fractured bedrock. The channel bottom consisted of large rock and bedrock which appeared stable, aside for the above mentioned undermining, around the substructure units with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) A 6-foot-long area of undermining was observed at the southeast corner of Pier 3 with a height of 1.3 feet and with 2.5 feet of maximum horizontal penetration. The undermining was due to the fractured bedrock channel bottom, which has shifted from under the footing.
- (B) The masonry of Piers 2 and 3 was in good condition with no defects of structure significance observed.

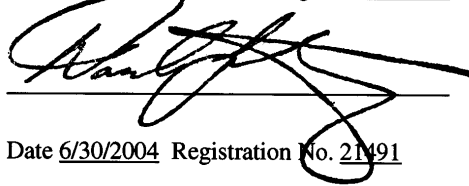
RECOMMENDATIONS:

- (A) Repair the undermining at the southeast corner of Pier 3 by placing grout bags and/or pumped grout within the undermined area to restore the full bearing capacity of the pier.

- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

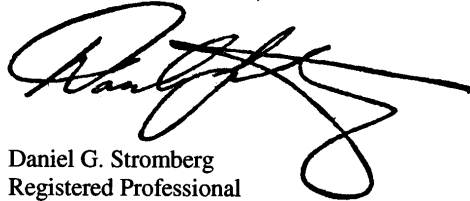
Daniel G. Stromberg

A handwritten signature in black ink, appearing to read 'Dan G. Stromberg', written over a horizontal line.

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A handwritten signature in black ink, appearing to read 'Dan G. Stromberg', written over a horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 5947

Feature Crossed: The Mississippi River

Feature Carried: CSAH No. 33

Location: District 3 - Benton County

Bridge Description: The superstructure consisted of a continuous steel truss bridge supporting a reinforced concrete deck. The superstructure is supported by three masonry piers and two masonry abutments. The piers are numbered 1 through 3 starting from the west and are founded on bedrock.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 27, 2002

Weather Conditions: Sunny, " 55E F

Underwater Visibility: " 2 Feet

Waterway Velocity: " 3.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 and 3.

General Shape: Rectangular piers with pointed upstream noses.

Maximum Water Depth at Substructure Inspected: Approximately 8.3 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the cap at the north end of Pier 3.

Water Surface: The waterline was approximately 10.5 feet below reference.

Waterline Elevation = 982.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

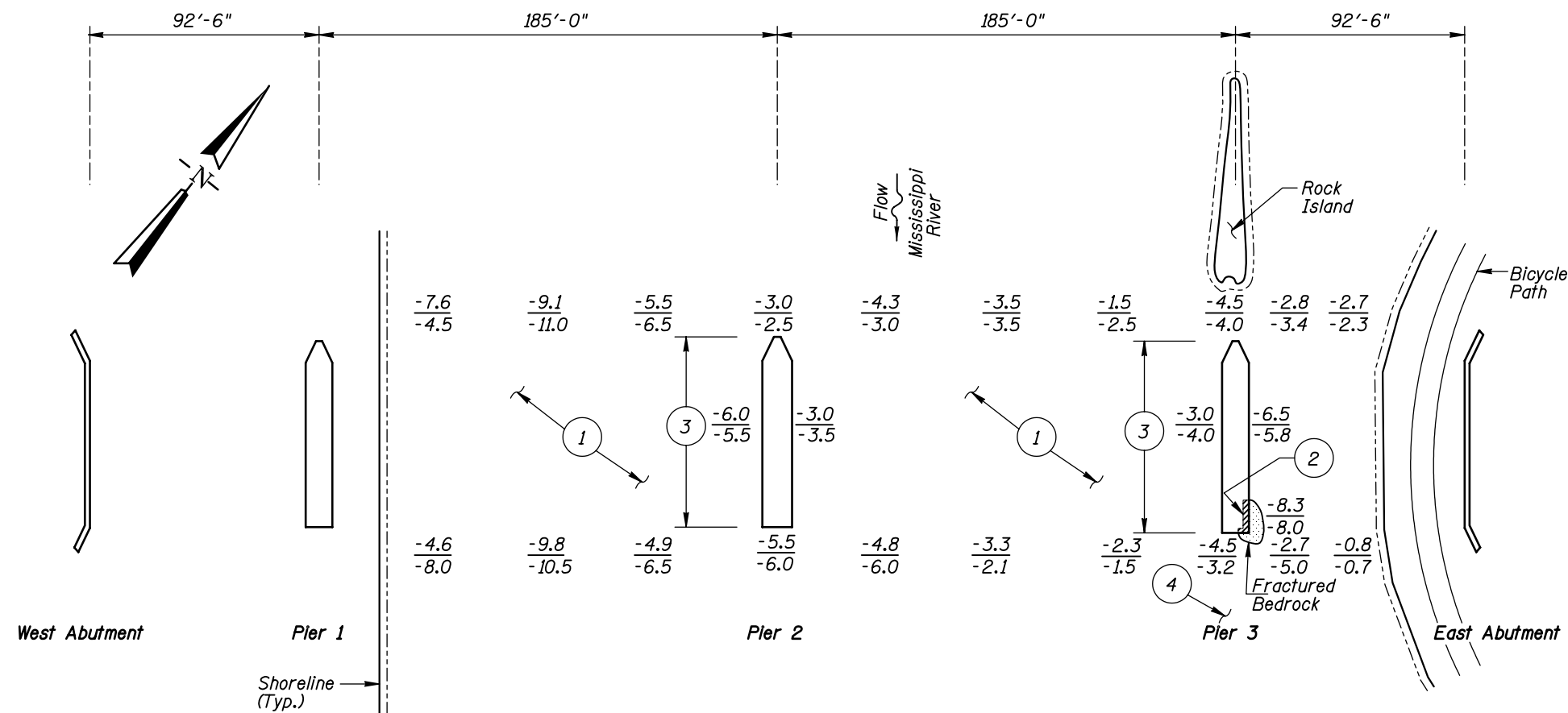
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code L/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes X No

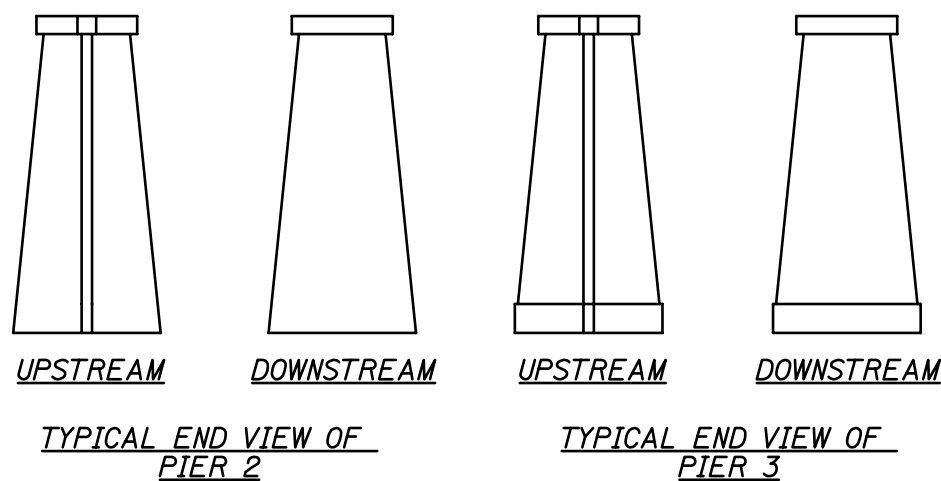


GENERAL NOTES:

- Piers 2 and 3 were inspected underwater.
- At the time of inspection on September 27, 2002, the waterline was located approximately 10.5 feet below the top of the cap at the upstream end of Pier 3. This corresponds to a waterline elevation of 982.7 based on the previous report dated September 5, 1997.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom material consisted of large rocks and bedrock with no probe rod penetration.
- Undermining was observed at the southeast corner of Pier 3 due to an area of fractured bedrock. The undermining cavity was 1.3 feet high by 6 feet long with 2.5 feet of maximum horizontal penetration.
- The masonry construction of the substructure units were observed to be in overall good condition.
- 1- to 5-foot-diameter rocks scattered in the channel downstream of Pier 3.



Legend

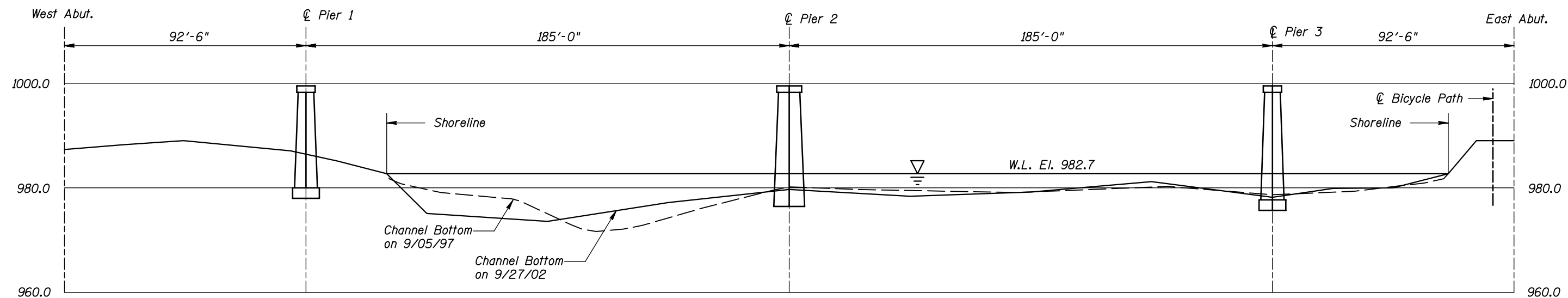
- 2.0 Sounding Depth from Waterline (8/27/02)
- 5.2 Sounding Depth from Waterline (8/5/97)

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

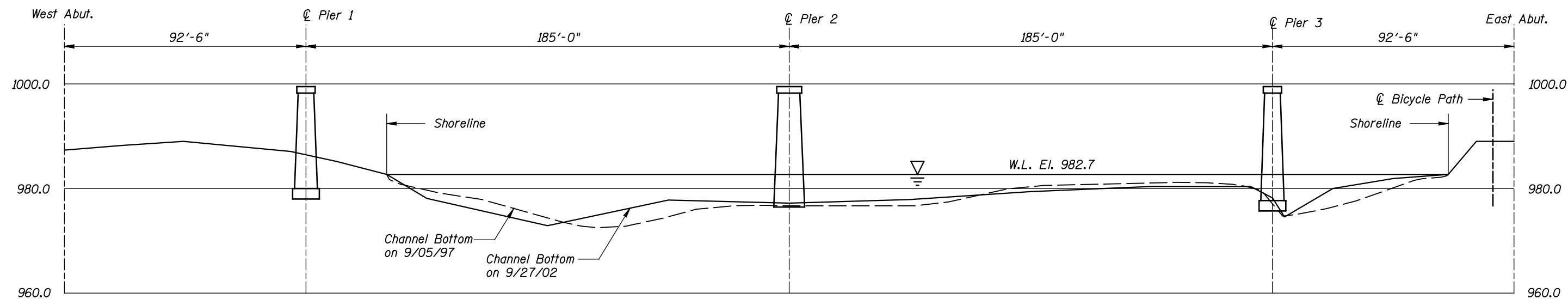
STRUCTURE NO. 5947
OVER THE MISSISSIPPI RIVER
DISTRICT 3, BENTON COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 3512015A		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Notes:

Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 5947
OVER THE MISSISSIPPI RIVER
DISTRICT 3, BENTON COUNTY
**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH
Checked By: MDK
Code: 3512015A

COLLINS ENGINEERS, INC.
300 W. WASHINGTON, STE. 600
CHICAGO, ILLINOIS 60606
(312) 704-9300

Date: SEPT. 2002
Scale: H1"=40' V1"=20'
Figure No.: 2



Photograph 1. Overall View of the Structure, Looking Northwest.



Photograph 2. View of Pier 2, Looking South.



Photograph 3. View of Pier 2, Looking North.



Photograph 4. View of Pier 3, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 27, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 5947 WEATHER: Sunny, " 55E F
WATERWAY CROSSED: The Mississippi River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton Brookins
EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera
TIME IN WATER: 12:30 P.M.
TIME OUT OF WATER: 1:45 P.M.
WATERWAY DATA: VELOCITY " 3.5 f.p.s.
VISIBILITY " 2 feet
DEPTH 8.3 feet maximum at Pier 3.

ELEMENTS INSPECTED: Piers 2 and 3

REMARKS: Overall, Piers 2 and 3 were found to be in good to satisfactory condition below water. A 6-foot-long, 1.3-foot-high area of undermining was observed at the southeast corner of Pier 3 with up to 2.5 feet of horizontal penetration. The undermining is due to fractured bedrock that has shifted from under the footing. The channel bottom, which consisted of large rock and bedrock, appeared stable with no appreciable changes around the substructure units since the previous inspection.

FURTHER ACTION NEEDED: X YES NO

Repair the undermining at the southeast corner of Pier 3 by placing grout bags and/or pumped grout within the undermined area to restore the full bearing capacity of the pier.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 5947
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Mississippi River

INSPECTION DATE September 27, 2002

NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (UNDERMINING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER (MASONRY)
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	6.0'	N	7	N	9	N	7	7	N	N	N	7	N	N	N	N	N	8
	Pier 3	8.3'	N	7	N	9	5	5	6	N	N	N	6	N	N	N	N	N	8

*UNDERWATER PORTION ONLY

REMARKS: Overall, Piers 2 and 3 were found to be in good to satisfactory condition below water. A 6-foot-long, 1.3-foot-high area of undermining was observed at the southeast corner of Pier 3 with up to 2.5 feet of horizontal penetration. The undermining is due to fractured bedrock that has shifted from under the footing. The channel bottom, which consisted of large rock and bedrock, appeared stable with no appreciable changes around the substructure units since the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.